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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,413	02/04/2004	Norio Hasegawa	501.39158CX1	1925
20457	7590	12/27/2005	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			CHACKO DAVIS, DABORAH	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 12/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/770,413

Applicant(s)

HASEGAWA ET AL.

Examiner

Daborah Chacko-Davis

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,327,022 (Nishi) in view of U. S. Patent No. 6,544,721 (Saitoh) and U. S. Patent No. 6,103,428 (Hatai et al, hereinafter Hatai).

Nishi, in col 6, lines 48-67, in col 7, lines 1-11, in col 15, lines 20-24, in col 23, lines 6-10, discloses an exposure method of performing a first exposure on a photosensitive substrate (photoresist-coated substrate), through a first reticle (first mask), using UV light to form a first pattern (first mask pattern), performing a second exposure on the exposed substrate, through a second reticle(second mask pattern of the same layout as the first mask), using UV light to form a second pattern. Nishi, in col 4, lines 25-30, in col 24, lines 49-65, discloses that reticle comprises hole patterns, line patterns etc. Nishi, in col 15, lines 20-24, and in col 30, lines 65-67, in col 31, lines 1-10, discloses that the first and second exposures are scanning exposure processes. Nishi, in col 8, lines 1-14, in col 23, lines 6-6-9, discloses that the light system is a reduction projection system, and that illumination is deformed (light transmitted is deformed) and the patterns formed lack resolution (defects in masks) (claims 1-2, 4, 6-8, 10, 12-14, 16,

Art Unit: 1756

and 18). Nishi, in col 19, lines 4-25, discloses that the illumination pattern is projected obliquely with respect to the optical axis (claims 5, 11, and 17).

The difference between the claims and Nishi is that Nishi does not disclose that the reticles are phase-shifting masks and that the phase of the light passing through the first phase-shift mask pattern is inverted from that of the second phase shift mask pattern. Nishi does not disclose auxiliary patterns formed around the mask patterns (first and second mask pattern). Nishi does not disclose that the first and second phase shift masks have a substrate groove shifter (claims 3, 9, and 15).

Saitoh, in col 5, lines 30-45, in col 6, lines 1-17, in col 9, lines 66-67, in col 10, lines 1-2, in col 11, lines 23-25, discloses shifters formed in the first and second masks, and that the light transmitting through the first mask pattern is inverted (in odd no. of π) relative to the light passing through the second mask.

The difference between the claims and Nishi in view of Saitoh is that Nishi in view of Saitoh does not disclose that auxiliary patterns are formed on the masks.

Hatai, in col 5, lines 47-55, and in col 9, lines 22-27, discloses that auxiliary patterns are formed on the mask patterns.

Therefore, it would be obvious to a skilled artisan to modify Nishi by employing phase shifting masks as suggested by Saitoh because Saitoh, in col 5, lines 24-47, discloses that employing multiple phase-shifting masks with respective phase shifters enables exposure at wavelengths less than 250nm and perform an effective exposure for even a complicated pattern. It would be obvious to a skilled artisan to modify Nishi in view of Saitoh by employing the auxiliary patterns on the mask as suggested by Hatai

Art Unit: 1756

because Hatai, in col 5, lines 49-67, and in col 6, lines 1-30, discloses that the auxiliary patterns on the mask function in reducing the exposure light and shifting the phase of the exposure light as a result of which deformation of the resist pattern formed can be prevented.

Response to Arguments

3. Applicant's arguments, see Remarks, filed September 28, 2005, with respect to claims 1-18, have been fully considered and are persuasive. The 103 rejection of claims 1-18, made in the previous office action has been withdrawn. A new 103 rejection has been made over claims 1-18.

A) Applicants argue that Nishi in view of Bae fail to disclose that the phase of light passing through the first phase shifting mask being inverted from that of light passing through the second phase shift mask.

Nishi in view of Bae has been withdrawn. See paragraph no. 2.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Art Unit: 1756

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd


December 21, 2005.



JOHN A. MCPHERSON
PRIMARY EXAMINER